By the use of Gimmingham's form of pump the exhaustion can be increased in a very short time, and the readings all obtained from one cylinder an inch in diameter. Three series of readings were taken agreeing very well with each other. At first there were discrepancies, owing to the porosity of the cylinder not being noticed, but these disappeared when care was taken. The temperatures were not corrected, as the results were not intended for publication, as I expected some other worker to repeat the experiment, but that not being the case I give the numbers as they are, premising that the temperatures, if corrected, would be 6° or 7° higher for the upper and 4° to 6° for the lower ones. The following are the numbers obtained :—

Pressure in millimetres.	Temperature of volatilisation.	Pressure in millimetres.	Temperature of volatilisation.
400	270	40	233
300	267	30	228
200	263	20	223
100	253	10	214
80	248	5	205
60	242	0	185

A determination done before those given above gave—

Pressure in millimetres.	Temperature of volatilisation.
68	245
10	222
5	210

But I do not place the same confidence on these numbers, as they were obtained in ignorance of the porosity of the solid; but they confirm the others. It appears from the above that mercuric chloride is no exception to the general law which makes the volatilising point rise or fall with the pressure. The low latent and specific heats of mercuric chloride make it not nearly so suitable an exponent of the truth of Regnault's conclusions as water; the latter allowing of a whole hour's continued experiment. I think after these experiments the idea of being able to raise solids in vacuo to temperatures above their ordinary volatilising or boiling points may be dismissed as inadmissible, except it may be in some rare case of allotropy. J. B. HANNAY

Private Laboratory, Sword Street, Glasgow

The Conservation of Electricity

By the kind permission of Messrs. Macmillan and Co. I am allowed to quote the following paragraph from the preface to my "Elementary Lessons in Electricity and Magnetism," shortly to be published by them in their School Class Books Series, and now in the press. The preface is dated "March, 1881."

"The theory of Electricity adopted throughout is that Electricity, whatever its nature, is *one*, not *two*: that Electricity, whatever it may prove to be, is not *matter*, and is not *energy*: that it resembles both matter and energy in one respect, however, in that it can neither be created nor destroyed. The doctrine of the *Conservation of Matter*, established a century ago by Lavoisier, teaches us that we can neither destroy nor create matter, though we can alter its distribution and its forms and combinations in innumerable ways. The doctrine of the *Conservation of Energy*, which has been built up by Helmholtz, Thomson, Joule, and Mayer, during the last half century, teaches us that we can neither create nor destroy energy, though we may change it from one form to another, causing it to appear as the energy of moving bodies, as the energy of heat, or as the static energy of a body which has been lifted against gravity or some other attracting force into a position whence it can run down, and where it has the potentiality of doing work. So also the doctrine of the *Conservation of Electricity*, which is now growing into shape,[1] but here first enunciated under this name, teaches us that we can neither create nor destroy electricity, though we may alter its distribution—may make *more* to appear at one place and *less* at another—may change it from the condition of rest to that of motion, or may cause it to spin round in whirlpools or vortices which themselves can attract or repel other vortices. According to this view all our electrical machines and batteries are merely instruments for altering the distribution of electricity by moving some of it from one place to another, or for causing electricity, when heaped up in one place, to do work in returning to its former level distribution. Throughout these Lessons the attempt has been made to state the facts of the science in language consonant with this view, but rather to lead the young student to this as the result of his study than to insist upon it dogmatically at the outset."

The above paragraph is published at the present time because, since the date when my manuscript was sent to the publishers, a memoir has been presented to the Académie des Sciences bearing the title, "Sur le Principe de la Conservation de l'Électricité, ou seconde Principe de la Théorie des Phénomènes Électriques." Of this memoir, which is by M. G. Lippmann, only a brief extract has as yet been published in the *Comptes rendus* of the sitting of May 2, when it was read. In that short extract the general doctrine of the conservation of electricity is laid down with considerable clearness, and an elegant analytical expression of it is given in the briefest form, the author promising some examples of its application to the prediction of new and important phenomena. The publication of the complete memoir of M. Lippmann will no doubt be awaited with interest.

As my manuscript was placed in the hands of Messrs. Macmillan and Co. on the very day when the above extract was written, the phraseology used by M. Lippmann must have been adopted by him in entire independence of me. Since some weeks must elapse before my "Elementary Lessons" will be in the hands of the public, I wish to avoid, meantime, all chance of misunderstanding by taking the earliest opportunity, firstly, of making this acknowledgment, which is due to M. Lippmann, and secondly, of establishing my right to use the language of my preface as to the explicit enunciation of *the doctrine of the Conservation of Electricity*. SILVANUS P. THOMPSON

University College, Bristol, May 19

The Florence Herbarium

I BEG to forward to you the inclosed protest of the botanists of Florence against the proposed removal of the Herbarium and adjoining Botanical Garden at Florence to a new locality in that city.

It is well known to all botanists who have visited that city that, taking into account the importance of the herbarium, the admirable building in which this and the other collections are lodged, and the annexed botanical garden, the establishment at Florence deserves to rank amongst the first in the world, and is indeed scarcely second to any except that at Kew. It has an especial interest in the eyes of Englishmen, owing to the fact that it includes the invaluable collections of the late Mr. Barker Webb, which include, besides the type specimens of the Canary Island flora and of his other works, those still more important of Labillardière, of Rinz and Pavon, and of Desfontaines, whose herbaria all passed into his hands.

Although well acquainted with the Florence Museum, and disposed to believe that it would be difficult to find another locality equally well adapted for the purpose, I was unwilling to express any opinion on the subject without full information as to the new arrangements proposed in substitution for those now so excellent.

Within the last month my friends Sir Joseph Hooker and Dr. Asa Gray have visited Florence, and have carefully examined the present building and its appurtenances, and also the sites to which it is proposed to remove the herbarium and botanic garden. I learn that they have expressed an unqualified opinion that the proposed new building is altogether unsuited for the purpose, and would too probably tend to the injury and ultimate loss of the herbarium, while the site of the proposed botanic garden is also an unfavourable one.

Sir Joseph Hooker has written a full statement of his views to Prof. Carnel, recently appointed Director of the Botanical Museum, who has not, I believe, as yet published his opinion on the subject.

Under these circumstances I venture to hope that you will publish the accompanying document, with a view to prevent the accomplishment of a design so injurious to natural science. Those who wish to associate their names with the protest are invited to send them to M. E. Sommier, Lung'Arno, Corsini, Florence. JOHN BALL

10, Southwell Gardens, London, S.W., May 20

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[1] This is undoubtedly the outcome of the ideas of Maxwell and of Faraday as to the nature of electricity. It has nowhere been more excellently or pithily put into shape than in a discourse delivered by Dr. Oliver J. Lodge before the London Institution, "On the Relation between Light and Electricity," December 16, 1880 (NATURE, vol. xxiii. p 302).

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Florence, 5 Mars, 1881

A propos du déplacement projeté des collections botaniques du Musée d'Histoire Naturelle de Florence.

Lorsqu'au mois de Mai de l'année 1874 un grand nombre de botanistes de toutes les parties du monde se trouvèrent réunis à Florence, dans les salles des Collections botaniques fondées par feu le professeur Parlatore, M. le professeur Alphonse de Candolle fit observer " qu'une des choses les plus remarquables s'imposant à l'attention des membres du Congrès, était le Musée botanique, avec ses salles amples et commodes, où avaient lieu les séances du Congrès." (" Actes du Congrès Botanique international, tenu à Florence au mois de Mai 1874," pag. 220.)

Personne, alors, n'eût soupçonné que ce qui avait été jugé digne d'admiration par les hommes les plus compétents, serait déclaré mauvais et condamné à un bouleversement radical sept ans à peine après que ces paroles mémorables avaient été prononcées. Pour justifier l'abandon du Musée actuel, on prétexte l'inconvénient qu'il y a pour les étudiants fréquentant les cours de l'Institut des Études supérieures, place St. Marc, d'avoir à se rendre, pour une autre partie de ces cours, au Musée de Via Romana ; et, afin de centraliser les édifices affectés aux études, on ne pense à rien moins qu'à opérer le déménagement des collections botaniques et à abandonner le jardin du Musée, avec toutes ses serres et annexes. En revanche, on parle de rendre à son ancien usage le modeste Jardin des Simples, situé à proximité du nouvel emplacement destiné aux herbiers. Mais a-t-on examiné si ce transport est réalisable, avantageux, et si le nouveau local de la place St. Marc, destiné à la Botanique, est adapté ou non à recevoir les herbiers et les autres collections ?

Or ce local n'est autre que le bâtiment des anciennes écuries des Grands Ducs de Toscane, occupées plus tard par la cavalerie italienne. Pendant une série non interrompue de près de trois cents années, ces écuries ont logé des chevaux en très-grand nombre, et c'est là que l'on se propose de colloquer des collections de plantes, d'un prix inestimable, et si faciles à se détériorer sous l'influence de l'humidité ! Il est vrai qu'en sacrifiant d'énormes sommes pour reconstruire l'édifice à peu près de fond en comble, on ferait peut-être disparaître les traces du long usage auquel il a servi ; mais il est permis de se demander si, même dans ce cas, on obtiendrait jamais des salles comparables à celles du Musée actuel, soit en beauté, soit en salubrité, soit en solidité.

Ce projet étant soutenu et sur le point d'être mis à exécution par des personnes respectables, mais étrangères à la Science et par conséquent incompétentes, nous Soussignés, amis de la Botanique résidents à Florence, croyons de notre devoir, dans l'intérêt des collections, de protester contre ce déplacement, et, afin de donner plus de poids à notre protestation, nous invitons les Botanistes qui se sont trouvés à Florence lors du Congrès de 1874, ainsi que tous ceux qui connaissent les salles actuellement affectées aux collections de plantes, à joindre leurs voix à la nôtre pour empêcher qu'on ne mette à exécution un projet que nous croyons hautement préjudiciable à nos plus chères études.

Nous prions en conséquence les Botanistes italiens et étrangers de vouloir bien employer leur influence afin que le projet en question soit abandonné, et que les sommes, dès à-présent destinées à une œuvre inopportune et risquée, soient de préférence employées à augmenter le matériel scientifique du Musée actuel, par l'achat de collections de plantes vivantes et desséchées (surtout de plantes cryptogames) et d'ouvrages manquant à notre bibliothèque botanique et à acquérir les armoires et étagères, nécessaires pour placer et mettre en ordre une immense quantité de paquets d'herbier, actuellement sans emploi et inutiles aux études, ainsi qu'à adapter les serres du Jardin botaniqe aux exigences modernes, en commençant par y faire les réparations reconnues de première nécessité.

(*Signé*) A. B. Archibald
D. Bargellini
Odoardo Beccari
Antonio Biondi
Emanuele G. Fenzi
Enrico Groves
Emilio Levier
E. Marcucci
Ugolino Martelli
Vincenzo Ricasoli
Riccardo Ricci
Niccolò Ridolfi
S. Sommier
P. de Tchihatchef

Barometer Pumps

Communications from Mr. Sprengel have been published, in which he has defended his claim to be the inventor of the mercury barometer-pump. As long as he confined himself to this claim I had no right to interfere, but by his letter in your previous number (vol. xxiv. p. 53) he claims to be the inventor or father of all kinds of barometer-pumps. His right to this claim I dispute ; for in May, 1847, I obtained a patent for improvements in sugar-refining, one of which is the conversion of a vacuum-pan into a large barometer by placing under a common vacuum-pan a long pipe in a perpendicular position, which acts as a pump whereby the sugar is taken out of the pan by its own weight in the long pipe, and thereby the vacuum in the pan is not destroyed, and the process of sugar-boiling is carried on continuously. The syrup to be boiled is added in the pan above, while the boiled sugar is taken out below through the barometer-pump. The specification of my patent was published in patent journals in London in 1847, and it is possible that Mr. Sprengel took the idea of his mercury barometer-pump from my sugar barometer-pump. But at all events Mr. Sprengel was not the first inventor of a barometer-pump. I claim that honour.

James Johnstone

Experiment Rooms, No. 1, James Square, Edinburgh,
May 21

The Hutton Collection of Fossil Plants

It has only within the last few days come to my knowledge (indeed only to-day authoritatively) that the Hutton Collection of Fossil Plants, at present deposited in the Museum of the Natural History Society of Northumberland and Durham, at Newcastle, had been named by the curator, Mr. Richard Howse, prior to the compiling by myself of a Catalogue of the Collection, published in 1878 by the North of England Institute of Mining and Mechanical Engineers. The labels on the specimens, referred to in the Catalogue, were therefore Mr. Howse's, and not, as I until now imagined, either William Hutton's original ones, or mere copies of them.

Moreover an unsigned MS. list of the specimens in the Collection, agreeing with the labels, with which I was furnished by the Mining Institute, and which was used freely by me in drawing up the Catalogue, must now be regarded as the result of much time and labour spent by Mr. Howse in identifying and naming the whole of the Hutton Collection.

I trust you will allow me space in your paper to acknowledge now what I should have made a point of acknowledging in the preface to the "Catalogue," had I been made acquainted with the facts of the case at the time.

G. A. Lebour

College of Physical Science, Newcastle-upon-Tyne, May 18

"How to Prevent Drowning"

Mr. MacCormac's valuable article induces me to call attention to a prevalent error.

Almost every treatise on swimming tells the beginner that every one can float without exertion. Even Mr. MacCormac seems to imply that " lying quite still with the mouth shut and the head thrown well back in the water " is enough to insure any one against sinking. Now this may possibly be true for most men, but certainly not for all. I am a practised swimmer, fond of the water, and have often tried. Going through all the orthodox motions of the deep breath, the folded arms, and the head thrown back, I go down instantly. This is in fresh water ; in salt I believe I can just float, but have seldom had a good opportunity of trying. The fact is that men are very different in buoyancy. I have seen a man float motionless with head and shoulders out of the water. Others may be even denser than I am. Most men believe themselves capable of coolness and presence of mind. They should remember that these will neither supersede the art of swimming nor alter the laws of gravity.

St. John's College, Cambridge E. Hill

The Effects of Pressure on the Germination and Growth of Plants

The following experiments may be of interest to vegetable physiologists :—On April 7, at 11 p.m., two sets of mustard-seeds—five in each set— were sown on pieces of moist cotton-wool, arranged as follows :—One piece was placed in a small bottle, which was then secured to the curved extremity of a glass tube, into the long arm of which mercury was poured till a height of forty-five inches was reached above the level of the metal in the shorter arm. The second piece, with its seeds, was placed in an exactly similar bottle, the neck of which was then made to dip beneath mercury, the bottle, of course, like the one soldered on to the tube, being inverted. This bottle was then placed beside the first.

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